

(12) UK Patent Application (19) GB (11) 2 188 032 (13) A

(43) Application published 23 Sep 1987

(21) Application No 8605639

(22) Date of filing 7 Mar 1986

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(51) INT CL⁴
B65D 6/28

(52) Domestic classification (Edition I):
B8P J K4

(56) Documents cited

GB A 2026427	GB 1000761	US 3941300
GB 1490896	US 4019674	US 3756493

(58) Field of search
B8P
Selected US specifications from IPC sub-class B65D

(54) Trays

(57) A tray is assembled from two moulded plastics end panels 1 and a board body 10. The body 10 is folded from a blank, with flaps 13 turned back to form thickened borders at the ends that engage with the end panels 1. The end panels 1 have barbed members 7 and 8 that engage the flaps 13 and hold the end panels to the body 10.

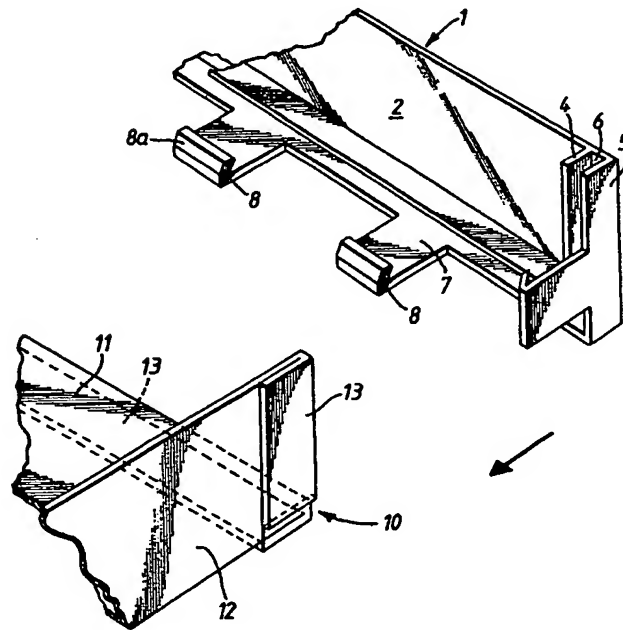


FIG. 5.

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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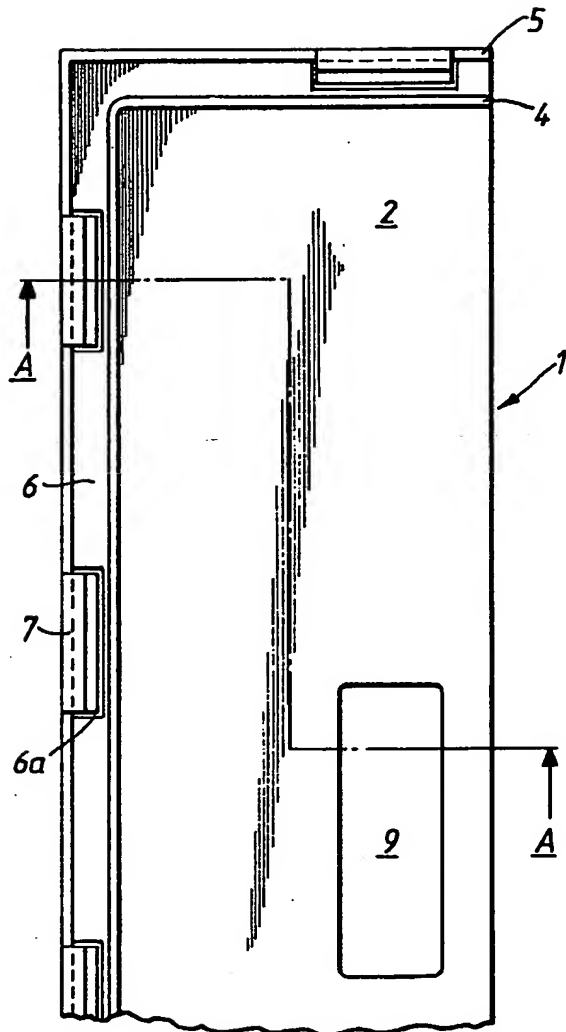


FIG. 1.

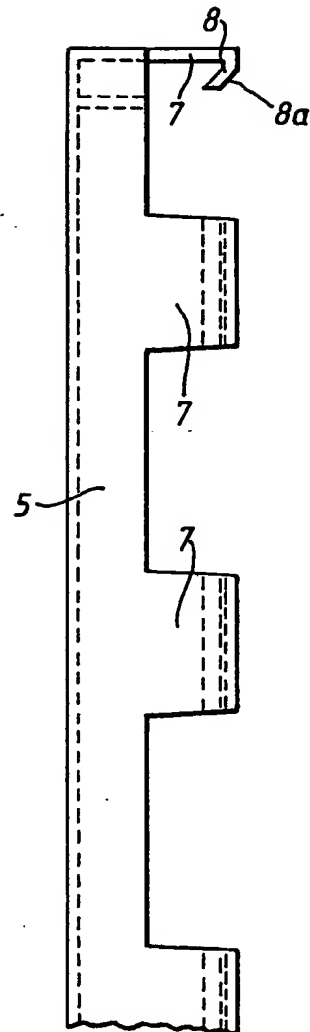


FIG. 2.

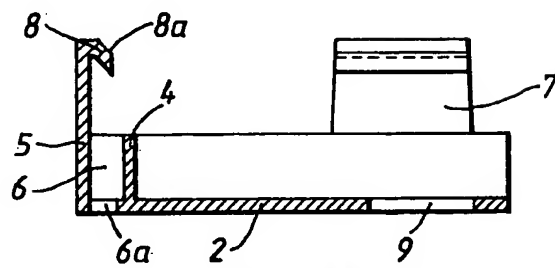
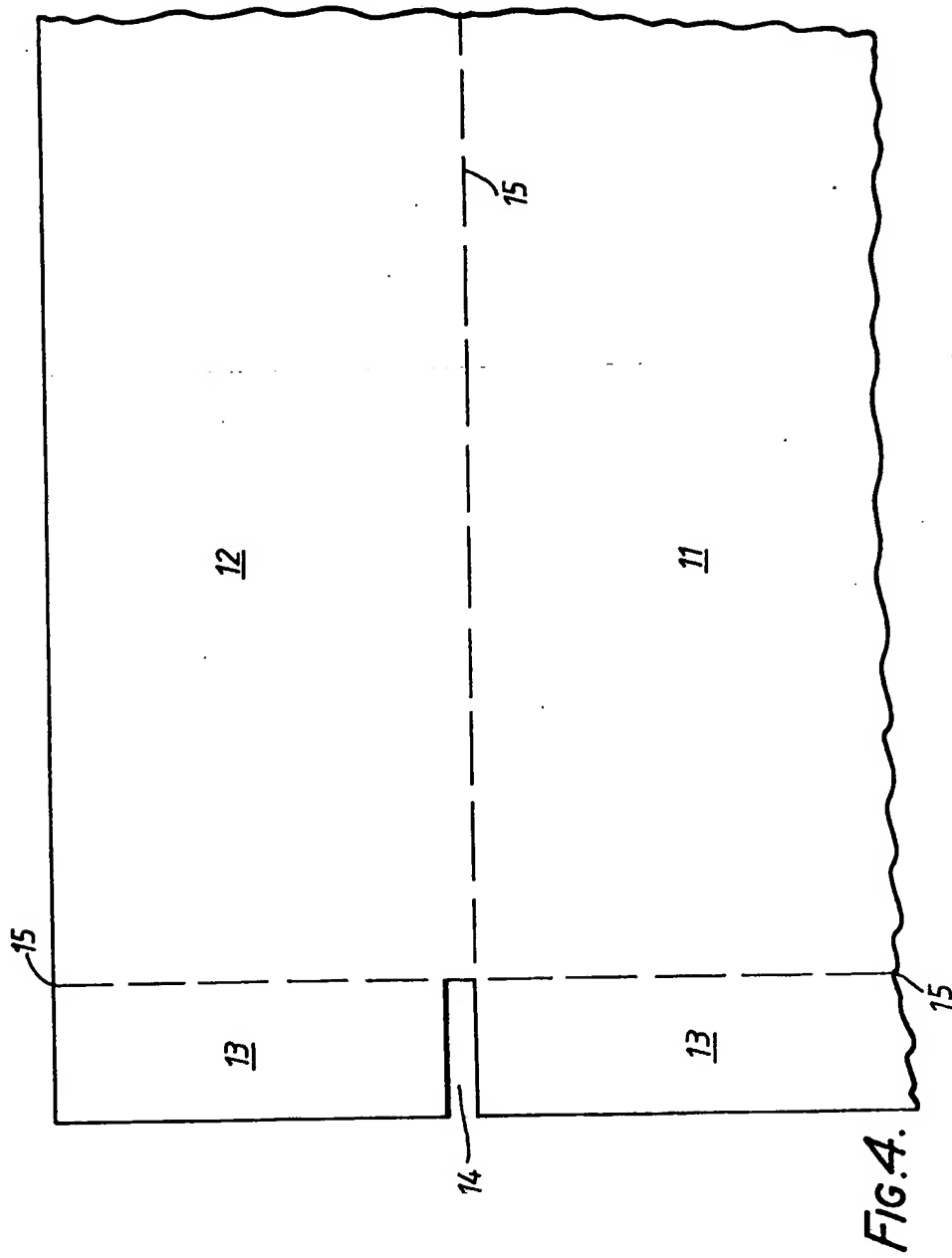


FIG. 3.

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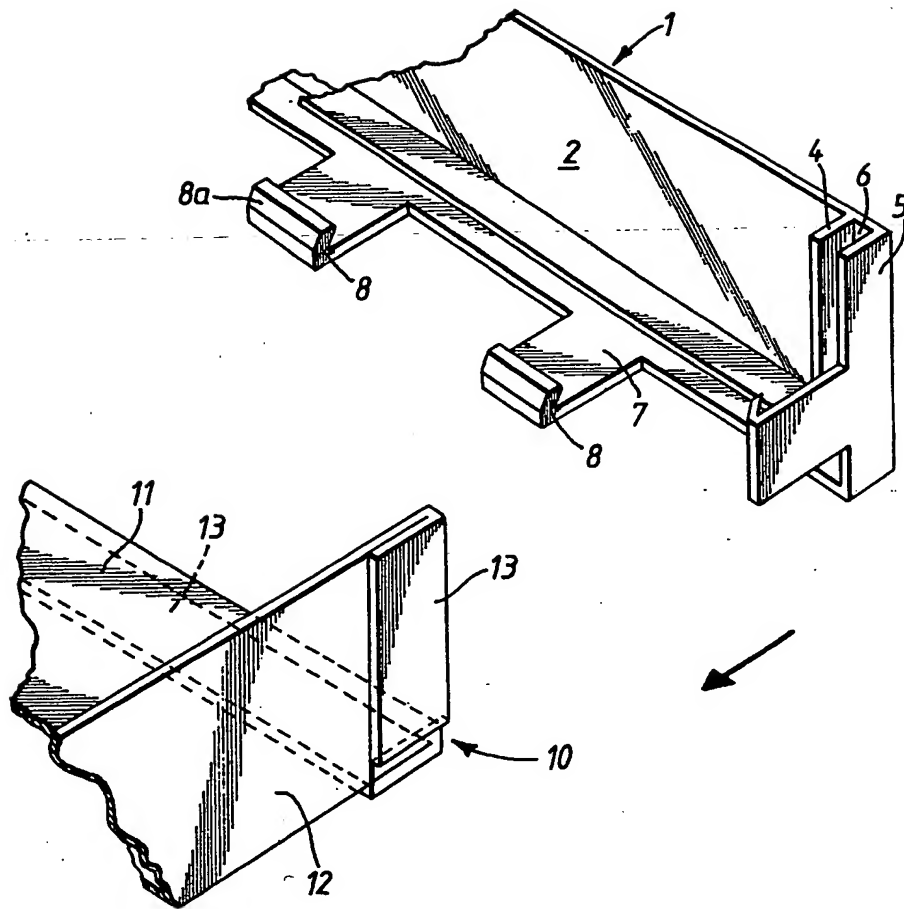


FIG. 5.

SPECIFICATION

Improvements in and relating to boxes or trays

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The invention relates to a box or tray having a bottom and sides formed as one piece and separate end panels.

The invention provides a box or tray comprising a body part and two end panels, wherein the body part comprises a generally rectangular blank folded to form a bottom panel, two side panels, flaps at both ends of the bottom panel folded back against the bot-

tom panels, and flaps at both ends of each side panel folded back against their respective side panel; and each end panel is provided with a channel extending around three sides of a notional rectangle within which is received an end portion of the body panel, and each end panel is provided with a plurality of means engaging the distal edges of the flaps to retain the body and the end panel with the said end portion of the body part seated in the said channel.

It is possible in accordance with the invention to construct a tray from three compact components with few and simple manufacturing steps that is sturdy, rigid, and economical.

Each said end panel may be generally rectangular and then advantageously has a pair of flanges along three sides of it extending perpendicular to the general plane of the end panel and constituting the sides of the said channel.

The means engaging the distal edges of the flaps are advantageously barbed means, and preferably comprise a plurality of members extending from, and preferably integral with, one of the said flanges, advantageously, the outer flange, in the plane of that flange, each having at its distal end a barb projecting towards the plane of the other flange.

Apertures are then preferably provided in the bottom of the channel in alignment with the barbs.

The flaps may be adhesively united with their respective side and bottom panels, but in at least some circumstances it will be found that the interengagement of the body part and the end panels, and especially of the flaps and the means engaging their distal ends, is sufficient to hold the flaps in place without the use of any adhesive.

Each said end panel may be formed with handle means, which may comprise apertures, for lifting the box or tray.

The invention also provides a panel suitable for use as a said end panel of a box or tray according to the invention.

The invention further provides a generally rectangular blank for the body part of a box or tray according to the invention. The bottom panel, the side panels, and the flaps in the blank are advantageously separated by lines of

flexural weakness, and adjoining said flaps may be separated from each other by slots along the extensions of the lines separating the bottom and side panels.

One form of box or tray constructed in accordance with the invention will now be described by way of example only with reference to the accompanying drawings, in which:

Fig. 1 is a fragmentary elevation view of an end panel, from the inside;

Fig. 2 is a fragmentary bottom plan view of the end panel;

Fig. 3 is a section along the line A-A in Fig. 1;

Fig. 4 is a fragmentary plan view of a blank for the body of the tray; and

Fig. 5 is a fragmentary exploded perspective view of the tray.

Referring to the accompanying drawings, and initially to Figs. 1 to 3, an end panel indicated generally by the reference numeral 1 comprises a flat web 2 surrounded by a rim on three sides. The end panel 1 is rectangular and the side with no rim is one of the Longer sides. The rim comprises an inner flange, 4 and an outer flange 5 defining between them a channel 6. The flanges 4 and 5 extend perpendicular to the plane of the web 2 on one side of the web, and the channel 6 is rather deeper than it is wide.

A plurality of strips 7 extend from the outer flange 5 in the plane of the flange, and are formed at their distal ends with barbs 8 that overhang the channel 6 over slightly more than half of its width and are angled back towards the plane of the web 2. On their sides away from the channel 6, the barbs 8 have angled faces 8a sloping towards the middle of the web 2.

The web 2 may be provided with apertures 9 that may be used as handles.

The end panel 1 is moulded from a suitable plastics material. Apertures 6a are provided in the bottom wall of the channel 6 under the barbs 8, which enables the moulds to be greatly simplified without appreciably weakening the structure.

Referring now also to Figs. 4 and 5, a body indicated generally by the reference numeral 10 is formed from a generally rectangular blank that is folded to form a bottom panel 11 and two side panels 12. An end portion at each end of the blank is folded back to form flaps 13 that lie flat against the outside of the bottom panel 11 and the side panels 12. The fold lines may be defined by creases 15 stamped into the blank to enable the body to be folded up easily and accurately. To facilitate the folding, the flaps 13 may be separated from each other by slots cut along the continuations of the fold lines between the bottom panel 11 and the side panels 12. The flaps 13 may be coated with adhesive over at least part of their area to secure them to the bottom and side panels 11 and 12. The body

10 may be of stiff corrugated board or any other suitable board material depending on the size of the tray.

The width of the bottom panel 11 and the height of the side panels 12 correspond to the lengths of the sides of the end panel 1, and the width of the channel 6 is twice the thickness of the material of the blank 10, so that when the tray is assembled the ends of the body 10 fit snugly into the channel 6. The width of the flaps 13 (that is to say, their dimension measured in a direction perpendicular to the fold-line that separates them from the bottom and side panels 11 and 12) is slightly greater than the distance between the bottoms of the channels 6 and the tips of the barbs 8, and when the ends of the body 10 are pushed into the channels 6 in the end panels 1 (in the direction of the arrow in Fig. 5) the strips 7 with the barbs 8 are deflected outwards by a wedge action on the faces 8a, and then snap in again behind the flaps 13, the tips of the barbs seating in the angles defined between the ends of the flaps and the outsides of the side and bottom panels 11 and 12. The end panels 1 are then held securely to the body 10 of the tray without any further manufacturing operation being necessary.

Although the flanges 4 and 5 are shown in the drawings as being of equal height (measured from the plane of the webs 2) and about half the height of the strips 7, either or both may be higher. The inner flange 4 may rise almost to the height of the tips of the barbs 8. The outer flange 5 may rise the full height of the strips 7, so that the barbs 8 in effect project from the top of a continuous wall and not from projecting strips at all.

Instead of being on the outer flange 5, the strips 7 may be on the inner flange 4, with the barbs 8 then projecting outwards over the channel 6. The flaps 13 must then be folded into the inside of the bottom and side panels 11 and 12, and the slot 14 must be twice as wide as the material of the body 10 is thick, with the fold line between the bottom and side panels aligned with one side of the slot, as is shown in Fig. 4.

The end panels 1 may be pressed or fabricated from metal or any other suitable material instead of being moulded from a plastics material.

As an example of suitable dimensions, the tray may be 10 cm deep, 30 cm wide, and from 40 to 50 cm long, and the body 10 may be of corrugated board from 3 to 5 mm thick. There may then be one strip 7 at each end of each side panel 12 and four at each end of the bottom panel 11, each strip 7 being 3 cm wide, and the flaps 13 may be from 3 to 4 cm wide. The dimensions of the tray may, however, differ considerably from those mentioned, provided that the thickness of the materials used and the number and size of the

strips 7 and barbs 8 are selected suitably having regard to the load that the tray is to carry.

CLAIMS

1. A box or tray comprising a body part and two end panels, wherein: the body part comprises a generally rectangular blank folded to form a bottom panel, two side panels, flaps at both ends of the bottom panel folded back against the bottom panels, and flaps at both ends of each side panel folded back against their respective side panel; and each end panel is provided with a channel extending around three sides of a notional rectangle within which is received an end portion of the body panel, and each end panel is provided with a plurality of means engaging the distal edges of the flaps to retain the body and the end panel with the said end portion of the body part seated in the said channel.

2. A box or tray as claimed in claim 1, wherein the flaps are adhesively united with their respective side and bottom panels.

3. A box or tray as claimed in claim 1 or claim 2, wherein each said end panel is generally rectangular and has a pair of flanges along three sides of it extending perpendicular to the general plane of the end panel and constituting the sides of the said channel.

4. A box or tray as claimed in any one of claims 1 to 3, wherein the means engaging the distal edges of the flaps are barbed means.

5. A box or tray as claimed in claim 4 when dependent upon claim 3, wherein the said barbed means comprise a plurality of members extending from one of the said flanges in the plane of that flange, each having at its distal end a barb.

6. A box or tray as claimed in claim 5, wherein the barbed members are integral with the said flange.

7. A box or tray as claimed in claim 5 or claim 6, wherein the said barbed members extend from the outer flange.

8. A box or tray as claimed in any one of claims 5 to 7, wherein apertures are provided in the bottom of the channel in alignment with the barbs.

9. A box or tray as claimed in any one of claims 1 to 8, wherein each said end panel is formed with handle means for lifting the box or tray.

10. A box or tray substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

11. A panel suitable for use as a said end panel of a box or tray as claimed in any one of claim 1 to 10.

12. A generally rectangular blank for the body part of a box or tray as claimed in any one of claims 1 to 11.

13. A blank as claimed in claim 12, wherein the said bottom panel, the said side panels, and the said flaps are separated by lines of

flexural weakness, and adjoining said flaps are separated from each other by slots along the extensions of the lines separating the bottom and side panels.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd, Dd 8991685, 1987.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.